

The Cost of **Green Power** ***in Competitive Power Markets***

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Defining Green Power



- Two components of green power:
 - **Commodity Energy**
 - | delivered real-time into the grid by ALL power plants
 - | can be sold forward or in spot markets close to delivery
 - | price reflects different value placed on peak and off-peak power
 - | typically “pre-scheduled” into a utility or ISO control area
 - **Green Certificates**
 - | represent the environmentally preferable attributes of a renewable power plant
 - | purely financial transaction with value determined by market
 - | does not need to be scheduled into the grid, or even originate from the same grid
 - | quantity produced based on a generator’s meter read

California's Competitive Green Market



- California's energy markets opened on March 31, 1998
- Green power is traded bilaterally and through APX Green Power Market
- California Energy Commission administers subsidies of \$540 million over 4-year "transition period" for:
 - generators through the existing renewables, new renewables and emerging renewables accounts
 - end-use customers through the customer credit

Price Paid to Generators in CA Competitive Market

- CEC Subsidy Based on Existing or New Technologies Account
PLUS
- Bilaterally-Agreed Price
OR
- Hourly Commodity Price and
- Green Premium

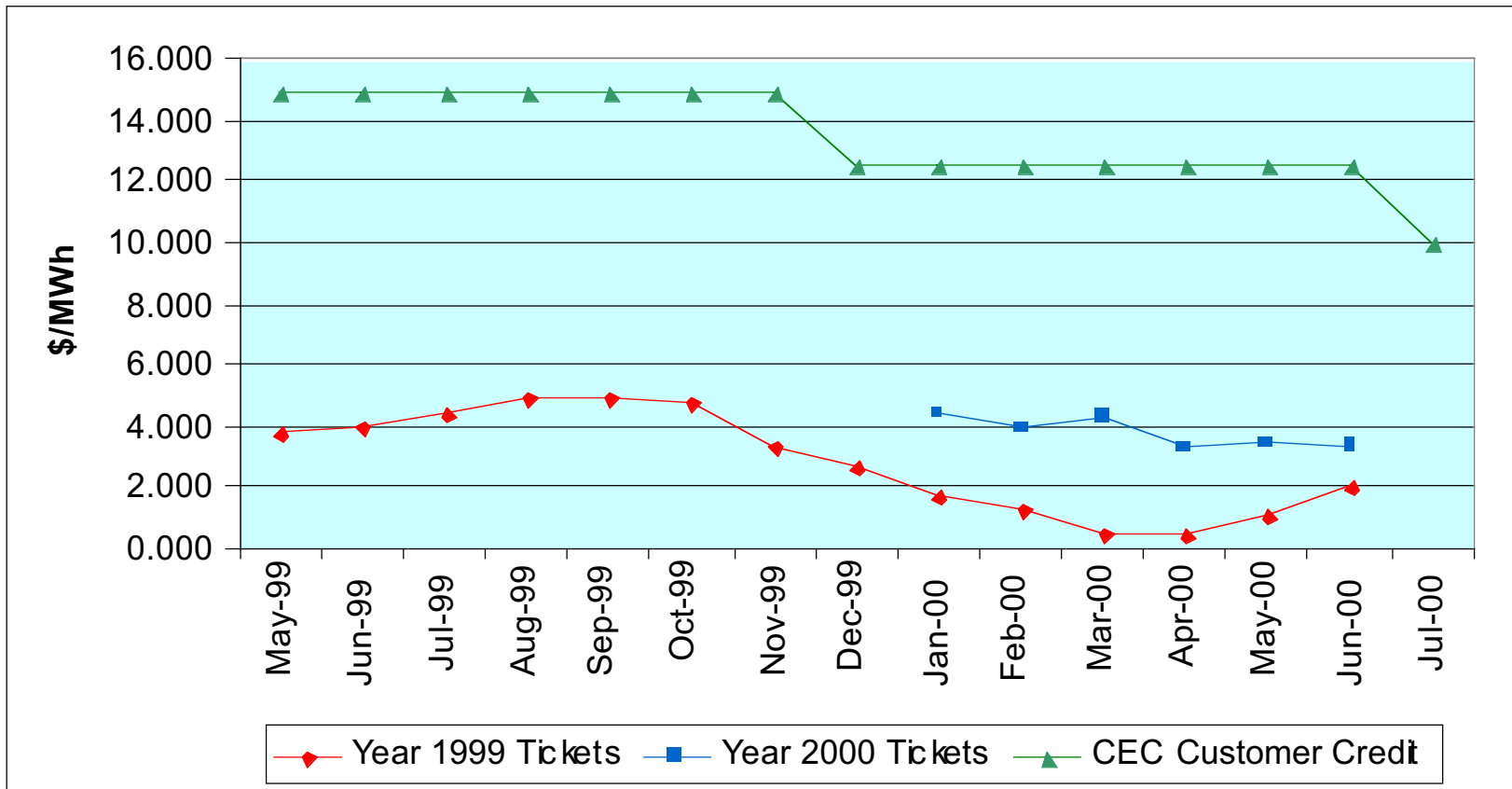
Subsidies for “Existing” Generators



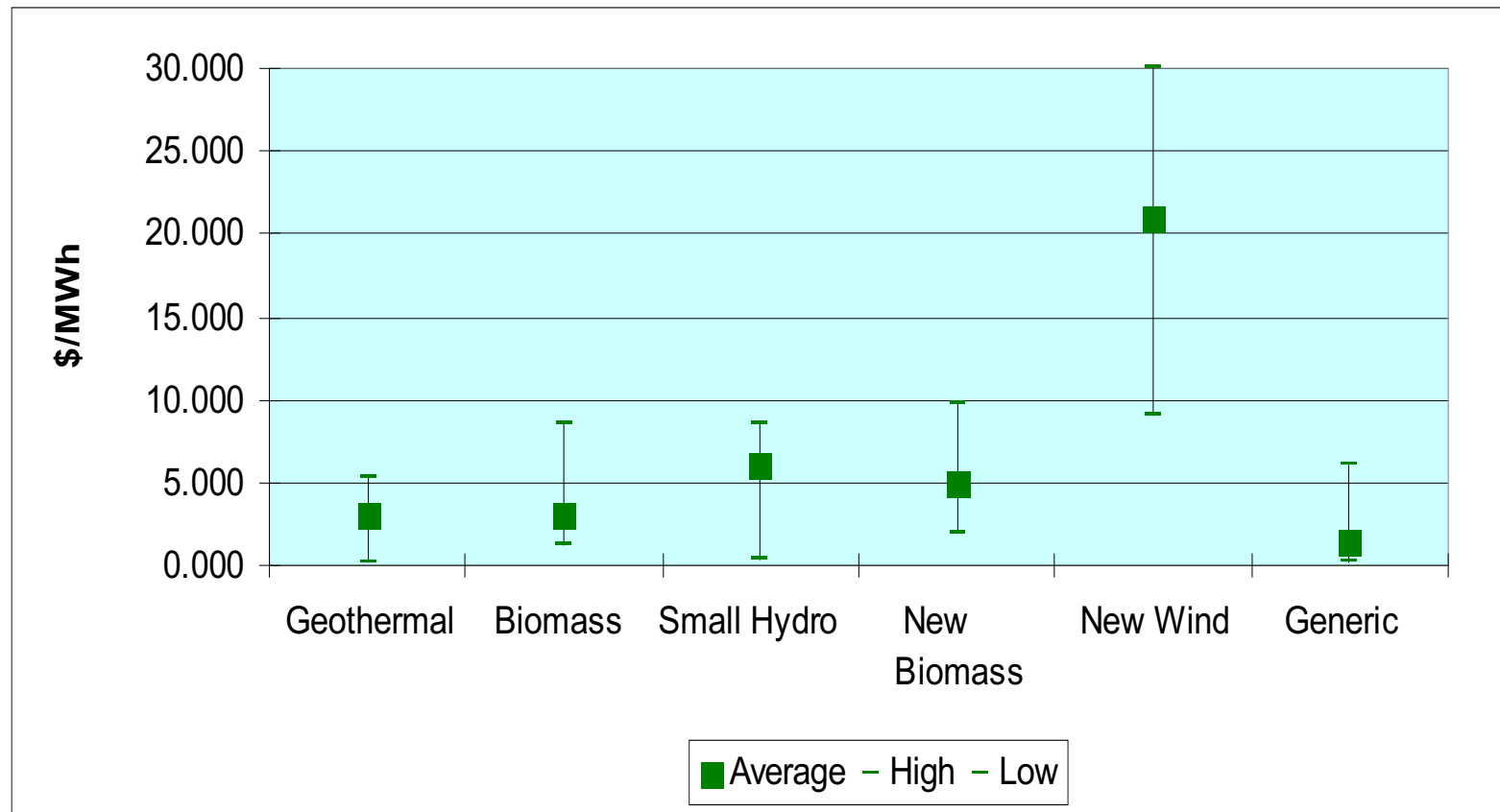
- Biomass and Solar Thermal:
 - 1 ¢/kWh in 2000 and 2001, with target price of 4¢/kWh in 2001 and 3.5 ¢/kWh in 2001
- Wind:
 - 1 ¢/kWh, with target price of 3.5¢/kWh
- Geothermal, Small Hydro, Landfill Gas:
 - 1 ¢/kWh, with target price of 3¢/kWh

(Target price based on SRAC of utilities)

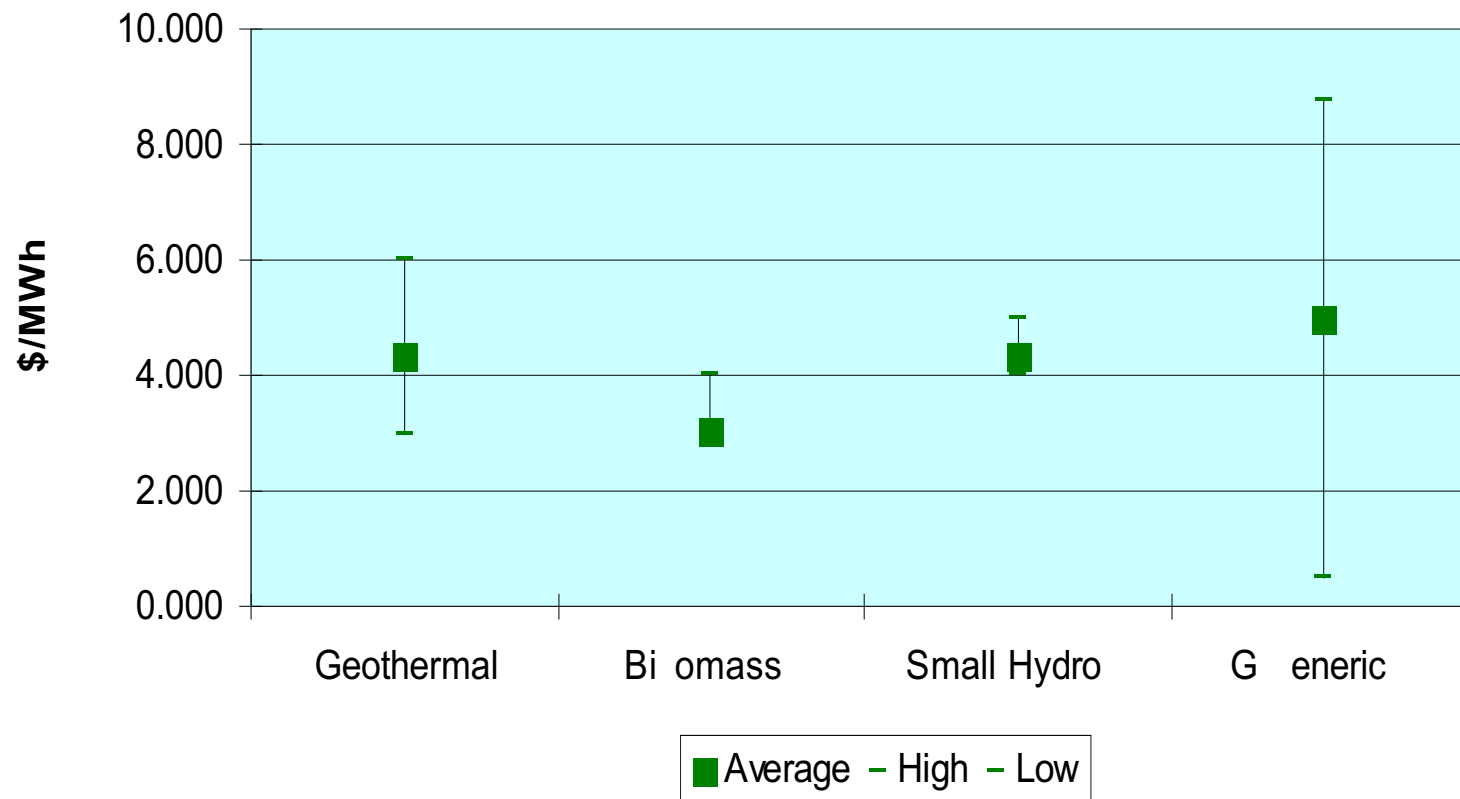
Monthly Average Green Ticket Price



Average, High and Low Prices for Year 1999 Tickets



Average, High and Low Prices for Year 2000 Tickets




What do these prices mean?



- Premiums are affected by Customer Credit
- Customer Credit is important in maintaining the green market in CA
- New resources command a higher premium
- Resources in shorter supply command a higher premium

What else does the green market need?



- Acceptance of unbundling of green attribute from energy in all states
- Verification process from generator to end-user that crosses state boundaries
- Transparent and liquid green certificate markets in more places than CA

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